

WHAT IS CLAIMED IS:

- 1 1. A pigment-based black ink, comprising:
2 at least one carbon black pigment dispersions and at
3 least one macromolecular chromophores (MMCs) ; and
4 an aqueous solution medium.
- 1 2. The pigment-based black ink as claimed in claim 1,
2 wherein the weight ratio of the carbon black pigment
3 dispersions to macromolecular chromophores (MMCs) is between
4 1:5 and 5:1.
- 1 3. The pigment-based black ink as claimed in claim 2,
2 wherein the weight ratio of the carbon black pigment
3 dispersions to macromolecular chromophores (MMCs) is between
4 1:2 and 2:1.
- 1 4. The pigment-based black ink as claimed in claim 1,
2 wherein the carbon black pigment dispersions has a particle
3 size of less than 1 μm .
- 1 5. The pigment-based black ink as claimed in claim 1,
2 wherein the macromolecular chromophores (MMCs) has a particle
3 size of less than 1 μm .
- 1 6. The pigment-based black ink as claimed in claim 1,
2 wherein the carbon black pigment dispersions is present in
3 an amount of 0.01 to 10 weight%.
- 1 7. The pigment-based black ink as claimed in claim 1,
2 wherein the macromolecular chromophores (MMCs) is present
3 in an amount of 0.01 to 10 weight%.

1 8. The pigment-based black ink as claimed in claim 1,
2 wherein the macromolecular chromophores (MMCs) is anionic.

1 9. The pigment-based black ink as claimed in claim 8,
2 wherein the macromolecular chromophores (MMCs) contains
3 carboxylate, sulfonate, or a combination thereof.

1 10. The pigment-based black ink as claimed in claim 1,
2 wherein the medium further contains an additive, the additive
3 comprises one of an organic solvent, surfactant, pH buffer
4 solution, chelating agent, biocide, humectant, preservative,
5 and UV-blocker.

1 11. The pigment-based black ink as claimed in claim 10,
2 wherein the medium contains 0.1 to 20 weight% of an organic
3 solvent.

1 12. The pigment-based black ink as claimed in claim 10,
2 wherein the medium contains 0 to 30 weight% of a surfactant.

1 13. The pigment-based black ink as claimed in claim 10,
2 wherein the medium contains 0.1 to 30 weight% of a humectant.

1 14. The pigment-based black ink as claimed in claim 1,
2 wherein the carbon black pigment dispersions is present in
3 an amount of x weight%, the MMCs is present in an amount of
4 y weight%, x is between 0.01 and 10, y is between 0.01 and
5 10, both based on the total weight of the pigment-based black
6 ink,

7 wherein the pigment-based black ink has a higher optical
8 density than ink containing (x+y) weight% of the carbon black
9 pigment dispersions and containing no MMCs , and wherein the
10 pigment-based black ink has a higher optical density than ink

11 containing (x+y) weight% of MMCs and containing no carbon
12 black pigment dispersions.

1 15. The pigment-based black ink as claimed in claim 14,
2 wherein the weight ratio of the carbon black pigment
3 dispersions to the MMCs is between 1:5 and 5:1.

1 16. The pigment-based black ink as claimed in claim 15,
2 wherein the weight ratio of the carbon black pigment
3 dispersions to the MMCs is between 1:2 and 2:1.

1 17. An inkjet printing method for increasing optical
2 density of an ink, comprising:

3 (a) providing a pigment-based black ink, wherein the
4 pigment-based black ink contains

5 at least one carbon black pigment dispersions and at
6 least one macromolecular chromophores (MMCs) ; and
7 an aqueous solution medium; and

8 (b) inkjet printing the pigment-based black ink onto a
9 recording substrate.

1 18. The method as claimed in claim 17, wherein the weight
2 ratio of the carbon black pigment dispersions to the MMCs is
3 between 1:5 and 5:1.

1 19. The method as claimed in claim 18, wherein the weight
2 ratio of the carbon black pigment dispersions to the MMCs is
3 between 1:2 and 2:1.

1 20. The method as claimed in claim 17, wherein the carbon
2 black pigment dispersions has a particle size of less than
3 1 μm .

1 21. The method as claimed in claim 17, wherein the
2 macromolecular chromophores (MMCs) has a particle size of
3 less than 1 μm .

1 22. The method as claimed in claim 17, wherein the carbon
2 black pigment dispersions is present in an amount of 0.01 to
3 10 weight%.

1 23. The method as claimed in claim 17, wherein the
2 macromolecular chromophores (MMCs) is present in an amount
3 of 0.01 to 10 weight%.

1 24. The method as claimed in claim 17, wherein the
2 macromolecular chromophores (MMCs) is anionic.

1 25. The method as claimed in claim 24, wherein the
2 macromolecular chromophores (MMCs) contains carboxylate,
3 sulfonate, or a combination thereof.

1 26. The method as claimed in claim 17, wherein the carbon
2 black pigment dispersions is present in an amount of x
3 weight%, the macromolecular chromophores (MMCs) is present
4 in an amount of y weight%, x is between 0.01 and 10, y is
5 between 0.01 and 10, both based on the total weight of the
6 pigment-based black ink,

7 wherein the pigment-based black ink has a higher optical
8 density than ink containing $(x+y)$ weight% of the carbon black
9 pigment dispersions and containing no MMCs , and wherein the
10 pigment-based black ink has a higher optical density than ink
11 containing $(x+y)$ weight% of MMCs and containing no carbon
12 black pigment dispersions.

1 27. The method as claimed in claim 26, wherein the weight
2 ratio of the carbon black pigment dispersions to the MMCs is
3 between 1:5 and 5:1.

1 28. The method as claimed in claim 27, wherein the weight
2 ratio of the carbon black pigment dispersions to the MMCs is
3 between 1:2 and 2:1.